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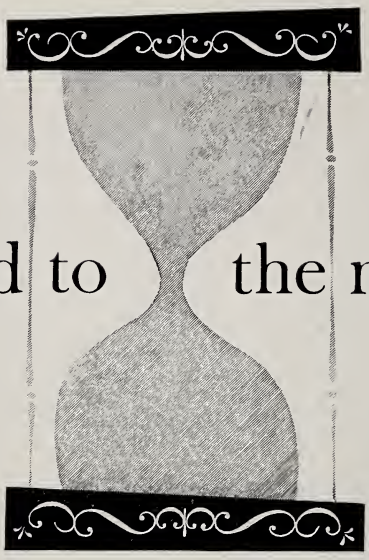

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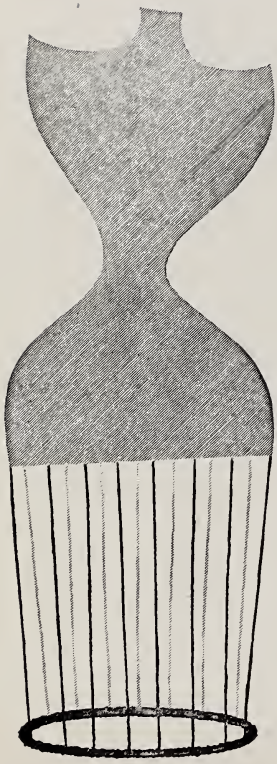

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Harvard Medical Alumni Bulletin

VOLUME 26 APRIL 1952 NUMBER 3

J. Englebert Dunphy, '33, Editor; Reginald Fitz, '09, Joseph Garland, '19, Richard Warren, '34, Associate Editors; Curtis Prout, '41, Business Manager; Mrs. K. B. Wilson, Assistant to the Editor. 25 Shattuck Street, Boston 15, Massachusetts.

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COVER—President Conant Talking to the Students at Vanderbilt Hall
Photograph by Donald N. Wysham, '53

Endemic Goiter in Argentina
An Inter-American Study

Douglas S. Riggs, M.D.
Assistant Professor of Pharmacology, Harvard Medical School

From the highlands of Colombia and Venezuela south through the mountains of Peru and Bolivia to the middle of Argentina a belt of endemic goiter follows the eastern slope of the Andes. On an arid plateau near the southern end of this belt lies the city of Mendoza, center of the largest wine-producing region in South America. The Rio Mendoza, fed by the snows of the mountains, has been diverted into a network of irrigation ditches and thousands of acres of sunny vineyards now flourish where once was only cactus and desert scrub. The Rio Mendoza never reaches the sea. Its water has turned into wine.

In the spring of 1950 Dr. Hector Perinetti, a surgeon of Mendoza, visited the Thyroid Clinic at the Massachusetts General Hospital. Dr. Perinetti had long been interested in the endemic of goiter in Argentina; he brought with him photographs of patients whose necks were deformed by truly enormous thyroids. Dr. James Howard Means at once proposed an expedition to Argentina to study iodine deficiency. Although the general nature of the adaptive response of the thyroid gland to iodine deficiency was familiar enough, accurate quantitative information was scanty. Iodized salt had practically eliminated endemic goiter from the United States long before the advent of radioactive iodine, and even before reliable methods for the chemical determination of stable iodine in biological materials became available. Why not apply these modern tools to the study of goiter in Mendoza where iodized salt was not yet in general use?

With Dr. Perinetti's enthusiastic support, arrangements for the expedition were concluded in the spring of 1951. Generous financial aid was provided by The Rockefeller Foundation, Parke Davis and Company, and the Loomis Foundation. In addition the Atomic Energy Commission of Argentina agreed to pay all of our expenses within the country and the Argentine government through the National University of Cuyo in Mendoza made funds available for purchasing the equipment needed for the measurement of radioactivity and for the chemical determination of iodine. From the very beginning, therefore, our work was sponsored by institutions on both sides of the equator. The members of the expedition were John B. Stanbury, '39, associate in medicine and physician directing the Thyroid Clinic at the Massachusetts General Hospital; Dr. Gordon L. Brownell, research associate in medicine and physicist at the Massachusetts General Hospital; Miss Eleanor Brown, technician, and myself. Besides Dr. Perinetti our collaborators in Mendoza included Dr. Juan E. Itoiz, biochemist, and (from Buenos Aires) Dr. Enrique B. del Castillo, Dr. Eduardo Trucco and Dr. Alberto B. Houssay. To our great regret, Dr. Means, having fathered the expedition, was unable to accompany us. As our leader, John Stanbury was responsible for the myriad details of purchasing and shipping equipment, arranging itineraries and organizing our work after our arrival in Mendoza. The care and skill with which he discharged these duties contributed immeasurably to the prompt initiation and steady progress of our studies during the seven weeks which we spent in Mendoza.

Through the good offices of Mrs. Christina Buechner, Secretary of the Commit-

tee on International Scientific Publications of the National Research Council, we were invited to lecture before various medical groups in Lima and Santiago on our way south, and in Montevideo, Rio de Janeiro and San Juan, Puerto Rico, on our way home. In each of these cities we were received with great cordiality. But I must resist the temptation to give a running account of our travels. However interesting to us, it would make a disjointed narrative. Let us get on to Mendoza, and by train, for that is how we crossed the Andes from Santiago.

The narrow gauge Trans-Andean Railway creeps up a wild valley, threads a rocky defile above a cascading river, bores through ridges and crosses snow-fields. At the divide it enters Argentina through La Cumbre tunnel, beneath the Christ of the Andes and just south of Aconcagua, highest peak in the western hemisphere. Even the first-class coaches were crowded, but the spectacular scenery more than made up for the discomforts of the journey. We arrived in Mendoza well after midnight, weary and unkempt. We had sent word ahead that no one need meet us; we would go directly to our hotel. It was something of a shock, therefore, to find a large delegation, including the Dean of the Faculty of Medicine of the University of Cuyo, waiting on the platform to welcome us; but it was also typical of the friendliness and hospitality which were accorded us throughout our stay in Argentina.

The following morning after paying our respects to the governor of the province, we were taken to the Central Hospital where we were to set up our laboratories. The hospital, supported entirely by government funds, was by far the largest building in the city, and its seventh-story roof afforded magnificent views of the foothills rising sharply from the plain some five miles to the west. The rooms assigned to us were pleasant and commodious. Our apparatus, which had been delayed in Buenos Aires, was flown to Mendoza by Army transport and our first shipment of radioactive iodine arrived almost simultaneously. In less than a week we were ready to start on our first patient.

I confess I had been worried about whether we would really find enough iodine deficiency to make the trip worthwhile. My doubts were immediately set at rest. Our arrival had been publicized in the local newspaper, and Dr. Perinetti's thyroid clinic was already crowded with patients. Big goiters and little goiters, diffuse enlargements and grossly nodular swellings—the problem was not at all one of finding patients, but rather of selecting from a large number those most suitable for our studies. In general we chose young people with soft and vascular glands, yet even in this early stage of goiter development some degree of nodularity was surprisingly frequent.

We knew, of course, that the thyroid enlargement and increased vascularity were compensatory adjustments which enabled the thyroid to obtain its normal daily requirement of iodide despite a much reduced concentration of iodide in the blood. But I don't believe we had fully anticipated the astonishing efficiency with which many of these glands collected iodine. In the very first patient studied, the thyroid accumulated ninety per cent of a tracer dose of radioactive iodine, and did it within six hours of the time of administration! In Boston such a great avidity for iodine would almost certainly indicate severe hyperthyroidism. Yet our patients in Mendoza were either euthyroid or, in a few instances when compensation was inadequate, slightly hypothyroid. In both Boston and Mendoza a high uptake of radioactive iodine betokens increased thyroid activity, but in Mendoza the increased activity may barely suffice to maintain a *normal* supply of thyroid hormone to the tissues.

Various technical difficulties delayed the setting up of our laboratory for the chemical analysis of iodine, but when the results finally started to come through we found

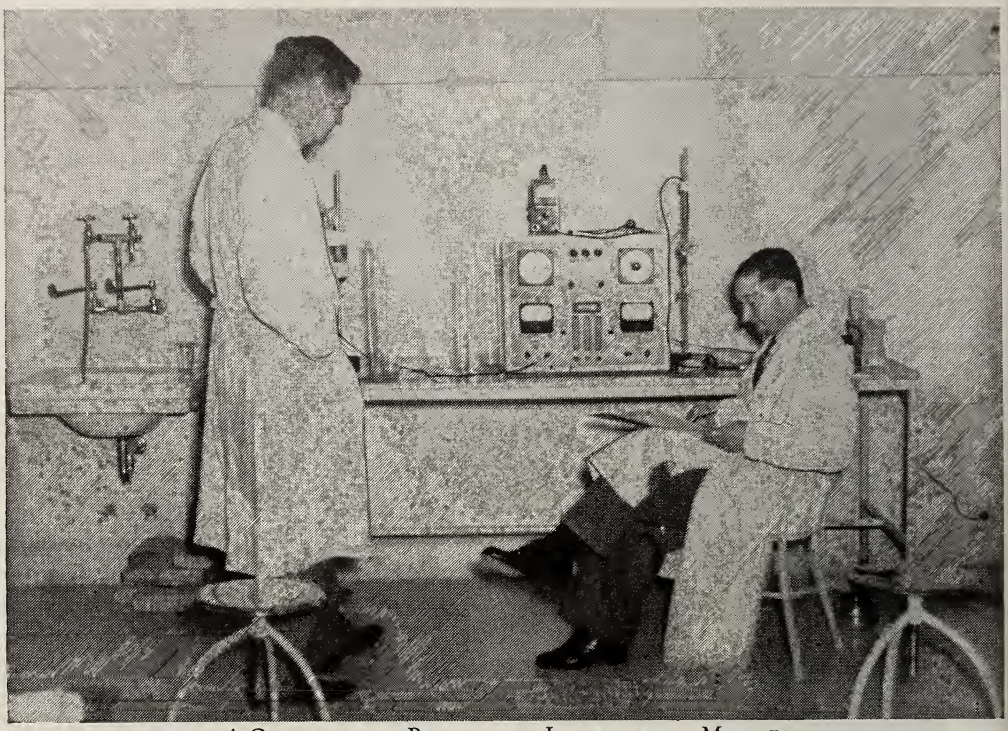
a very satisfactory correlation between the uptake of radioactive iodine by the thyroid gland and the daily excretion of stable iodide in the urine. When the excretion of iodide was as low as five or ten micrograms per day the uptake was usually very high. When the supply of iodide was more adequate, as indicated by a considerable urinary excretion of stable iodide, the uptake was lower. From these data we will be able to calculate the quantity of iodide required by the thyroid gland each day for the manufacture of a normal amount of thyroid hormone. In patients with severe iodine deficiency this quantity may be several times the actual daily intake of iodide, and the gland must satisfy its requirements largely by reutilizing iodide released from the peripheral metabolism of thyroid hormone. In certain patients we were able to demonstrate the importance of this reutilization by giving them a tracer dose of radioactive iodine and measuring the urinary excretion of radioactivity from day to day. After the first few days the urinary excretion stabilized at about 0.25 per cent of the administered dose per twenty-four hours. But when reutilization was blocked by 1-methyl-2-mercaptoimidazole, the daily excretion rose, in one instance to as high as seven per cent of the administered dose per day. The amount of radioactive iodine in the thyroid gland decreased correspondingly. Incidentally, the kidney does nothing to help conserve iodide when the supply is small. The renal clearance of iodide in Mendoza, as in Boston, was about 35 ml. of plasma per minute. To get 90 per cent of the available iodide, the thyroid gland must increase its clearance of iodide to about 315 ml. per minute. Small wonder these glands are highly vascular—they have to be!

The rapid loss of radioactive iodine from the thyroid gland blocked by 1-methyl-2-mercaptoimidazole clearly shows that the iodine deficient thyroid though large and active, has but a small quantity of stored hormone. It is living from hand to mouth. What happens when the iodide deficiency is corrected? To several patients we deliberately gave a normal supply of iodide (150 micrograms) each day for several weeks, and I, at least, expected to see a rapid decrease in thyroid activity. On the contrary, most of the glands continued to collect the same high proportion of a tracer dose of radioactive iodine. Evidently a considerable storage of hormone must occur before the thyroid is allowed to decrease its avidity for iodide. In contrast, the administration of rather small doses of desiccated thyroid inhibited thyroid activity quite promptly, presumably by decreasing the output of thyroid stimulating hormone from the anterior pituitary gland.

This is by no means a complete summary of our various studies; indeed, the studies themselves are far from complete, for we brought back with us about a thousand samples of plasma and urine which are still being analyzed. But it gives some idea of the kind of quantitative information we were after.

Our work was greatly aided by the wellnigh perfect co-operation of the patients who served as subjects for our investigations. Day after day, including Sundays and holidays, they would return to the hospital to await their turn in front of the Geiger counter or to deliver their twenty-four hour urine specimens, to have blood drawn or to receive medication. Of more than 120 patients studied only three or four failed to keep their scheduled appointments.

Throughout the summer a stream of visitors came from all over Argentina to watch us at work. They came sometimes by ones and twos, sometimes by the dozen. Before we left Mendoza we had been visited by representatives of every medical school in the country. We never quite got accustomed to working under almost continuous observation, just as we never quite got used to having dinner at nine o'clock in the evening. At first we persuaded ourselves that the novelty would soon wear thin and we would be left unvisited, but



A Corner of the Radioisotope Laboratory in Mendoza
John B. Stanbury, '39, left, and Dr. Hector Perinetti measuring the radioactivity in a sample of urine

this never came to pass. I sometimes wonder what our visitors thought of us, for they would catch us in such apparently trivial occupations as piling up bricks, drilling holes in rubber stoppers, carrying jugs of distilled water or measuring and bottling specimens of urine. We took care that they did not catch us in our dealings with an elderly cadaver into whose thyroid gland Dr. Perinetti sewed two glass capsules containing a measured amount of radioactive iodine. The cadaver was then carried upstairs from the morgue and seated in front of the Geiger counter to provide a correction factor for our *in vivo* measurements of radioactive iodine.

Our time was not devoted exclusively to work. Near the end of our stay in Mendoza we were taken to an *asado,* an enormous outdoor barbecue where the chief delicacy was a yearling roasted whole in a mud oven which had been previously heated by a brushwood fire. Our host was the owner of a wine factory and he kept us liberally supplied with the choicest of his dust-covered bottles. After the banquet a quartet of guitar players sang Spanish ballads in our honor, to which we had to respond by carrying them goblets of wine. The minstrels then saluted other members of the gathering with extemporaneous and exceedingly ribald ditties which we could persuade no one to translate.

My recollections of the later stages of this delightful occasion are peculiarly dim. I seem to remember my Argentinian friends insisting that I wear a twig of camphor leaves in my buttonhole as a sure protection against the wiles of the opposite sex. I cannot understand now what could possibly have made them think I needed such protection and I believe the procedure to be pharmacologically unsound. But at the time it seemed to be an entirely reasonable precaution. We were then taken on a tour of the winery during which I was overjoyed to find that my Spanish, hitherto painfully halting and

broken, had suddenly become remarkably fluent, and I was able to discuss the intricacies of wine manufacture in beautifully polished Castilian phrases. I awoke the following morning fresh and serene. No greater tribute can I pay to the gentle vintages of Mendoza!

As I look back upon our summer's work, I am satisfied that the data which we gathered are of themselves sufficiently interesting to justify the time and money expended. But I like to think that we accomplished more than this. In the first place we left behind us a going concern. Dr. Perinetti and his staff are continuing the study of endemic goiter, using the equipment which we brought to Mendoza. In the second place, we hope that our visit has provoked enough interest in the problem of iodine deficiency so that iodized salt will now be made available to the people of the region. And we hope that the effects of this simple prophylactic measure will be studied carefully with modern techniques.

Finally I would like to think also that this has been a successful experiment in international friendship and collaboration —collaboration which originates in common interests and which ripens into friendship as work progresses. It seems to me worth emphasizing that such collaboration can still be pleasant and profitable, even when two countries are as far apart politically as the United States and Argentina. And in some measure, may not the friendly collaboration of individuals in different nations contribute eventually to a better understanding between the nations themselves?

INSOMNIA AURORALIS

or

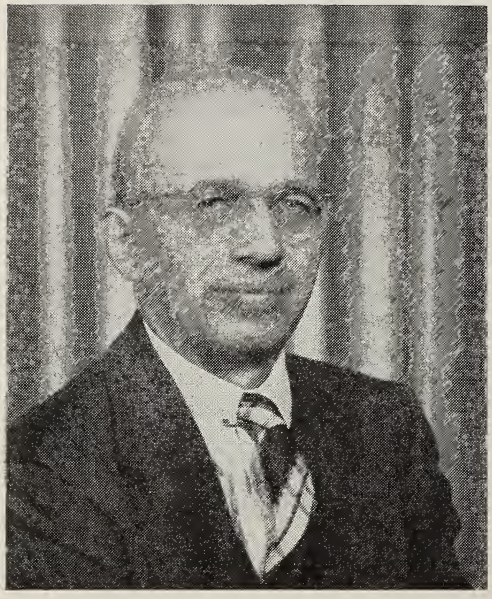
A Sonnet Written by a Sleepless Surgeon too Early in the Morning

Thoughts sleep as soldiers in nocturnal camp.
The eastern stars grow dim; far crows a cock.
One stirs. It naught avails the mind to lock,
For some internal fire has lit a lamp,
And fast are heard the hustle and the stamp
Of tousled legions rising up to mock
At slumber's agony. The soul-less clock
Waits not on tasks undone nor morning damp.
And 'tis no dream as first they brought me word,
For now on sharp command and bugle note
The tumult quickly dies. Down the array
'All present or accounted for!' is heard—
The thought platoons from rest have plucked the coat
And drum the fretful sanity of day.

R. W.

The Hidden Price Tag
A Study in Medical Research

Lester S. King, '32*



There is confusion in medicine today. Medical research is at an all-time high, and so are the costs of illness. Medical schools, at capacity operation, face severe deficits at the same time that medical education is open to sharp criticism. There is, perhaps, some logical connecting thread which can tie together these diverse propositions.

One basic trouble in medicine today is refusal to face an elementary fact: that everything has its price, even though the price is not always clearly marked or obvious. Whenever an advance in medicine has been made there is always temptation to consider it an example of pure gain. But there is no pure gain: every advance is accompanied by a compensatory loss. In comparison with the gains, the loss may not be significant; it may never attain significance. But sometimes many small unsuspected losses accumulate, combine, and, suddenly with little warning, erupt to threaten our complacency. The disappearance of the old-time general practitioner, the loss of personal relationships between doctor and patient, dissatisfaction with assembly-line medical care, unnecessary operations by unscrupulous physicians, the prolongation of medical "training," the increase of medical cultists and irregular practitioners—all of these and many more have been troublesome in recent years. Perhaps they are part of the hidden cost of modern scientific medicine. In a single brief article only a few facets can be examined. One of the most important is the status of medical research.

Now, research or investigation is only an outgrowth of curiosity. Somebody wants to find out something, and is willing to exert himself to get the answer. If he secures an answer to his question he thereby derives a great deal of satisfaction. This sort of thing we observe in purest form in small children. One child simply "wants to know" what happens when you throw a penny into an electric fan, while another is obsessed by the problem of whether or not he can hit a shutter with a snowball, without hitting the adjacent window. This type of curiosity is disinterested, seeking no other reward than its own satisfaction. When it is disciplined and mature, it is the stuff of which pure science is made. In this sense curiosity is personal and individual.

But some types of curiosity yield prac-

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tical concrete results above and beyond mere personal satisfaction. The satisfied curiosity of one person may incidentally satisfy needs and interests of other people. Pure science has had most cordial relations with practical or applied science wherein energy is devoted to a practical end. Usefulness is an added value attached to science, a different goal from mere satisfaction of curiosity. It is social rather than individual. Wherever curiosity serves a degree of social usefulness, society takes over at least some measure of support.

It is well recognized that scientists must be given considerable freedom. Even when society or some component thereof controls the support of curiosity, there is but little regimentation. In part the motive is sheer academic freedom, in part the hope that pure curiosity, if let alone, may eventually yield handsome practical benefits. Give enough scientific workers the liberty to follow their bent, and eventually, it is said, something useful will result. Sometimes the road may seem long and circuitous, sometimes much of the curiosity which is seeking satisfaction appears absurd and far-fetched. But any criticism may be immediately silenced by reference to the "prodigality of nature": if some desirable end-result is in view, nature tolerates enormous waste to gain that end. To secure one fruitful sperm, many millions are produced. Thousands of eggs are laid that a few may survive and mature. The workings of nature are indeed summarrized by the word "prodigality." The support of organized curiosity—let us call it "research"—is founded on this same principle. Let us multiply bits of knowledge and publish them, in the same way that a fish spawns many thousands of eggs. Each publication contributes a minutia of knowledge. Perhaps one will be of surpassing value. We cannot tell in advance how many of the thousands of fish eggs will hatch, nor which ones. We cannot tell in advance which of the thousands of publications will be practically useful. So, while we encourage fish to lay more and more eggs, we encourage authors to write more and more papers.

There is a great deal of confusion, however, concerning the purposes in view. If research is encouraged for the personal satisfaction of the researcher—in the same way as a fond parent might encourage a small child to take a clock apart—we have one type of situation. If, however, the research is promoted for the sake of some eventual practical use, the situation is rather different. In this latter case the trouble is not primarily financial. There is plenty of money available for research and no indication that sources of money are drying up. On the contrary, more becomes available every year, as the public becomes more and more "research conscious." The real drawback is more subtle. It lies in the corrosion of existing values, before new values can be developed. It lies too in the mockery of education.

II

There are certain familiar criticisms levelled against higher education in America, certain defects which are periodically viewed with alarm. For example, the American Medical Association has been studying college instruction with the aim of improving the pre-medical training and securing better qualified students for medical schools. In one recently published report, the chairman of the committee writes, "I am not so much concerned with what courses a student takes, but I am concerned that he get in touch with inspiring teaching, that he learn to think, to explore, to face problems and make decisions, to . . . develop the capacity and desire for a never-ending program of self-education. . ."[1] Another report points out some grave defects in present-day college teaching, defects which adversely influence the study of medicine. Among these drawbacks are listed "departmentalization and overspecialization," "poor or mediocre instruction," "too much lecture and too lit-

[1] Severinghaus, A. E. Basic values in professional education. Journal of the American Medical Association *146*:79, May 12, 1951.

tle active participation of the student in the learning process; too little independent inquiry and responsible judgment."[2]

One great medical educator has gone so far as to say, that premedical education, as such, should be abolished, while college training "should be a preparation not for medicine or dentistry or public health, but for life."[3] That is, a college should contribute a broad cultural background to the prospective physician.

But medical educators, unfortunately, are guilty of the very faults they decry. Medical teaching is anything but inspiring, over-specialization is rife, and a broad cultural background is a matter of lip-service only.

Teaching is not inspiring because there is no reward for skill or ability in teaching. A young man with great enthusiasm for teaching will never rise in the academic scale unless he has a series of publications as a passport to a higher academic grade. In general, promotions are on a more or less competitive basis. Ability in teaching cannot be weighed, measured, or counted, does not lend itself to any objective evaluation by a board of regents. Because of desire for an objective measure, academic prestige and advancement are closely tied up with research and accumulated reprints. How much simpler were the Middle Ages! In medieval universities an incompetent *magister* soon found himself without pupils and hence without a livelihood, whereas the effective teacher found his classes thronged. There was a definite proportionality between teaching ability and recognition. Today this is not the case. If teaching is crowded into the position of a chore, it will be performed as a chore. The students will suffer, and so will the public to whom these students will eventually minister.

Over-specialization is a closely allied fault. Research has produced desirable results, but effective research requires a narrowing of attention, that is, specialization. Since research is in general tied up with education, researchers are expected to teach, and even to seek academic honors.

The medical curriculum is erected on the basis of an increasing number of specialties. From the standpoint of the basic sciences, for example, each time-honored major subject is splitting up. Anatomy is no longer anatomy. It is histology, embryology, histochemistry, neuro-anatomy, as well as the conventional gross anatomy and something called surgical anatomy. Bacteriology, which once was a close bedfellow of pathology, now is not only independent but is in turn separating out into various subspecialties. And so on, all up and down the line. Each subspecialty is developed on the basis of meticulous but narrow research, by specially trained and specially interested men. Specialized workers give special courses in their special fields of interest. This is called, "keeping the student abreast with modern science." These courses become fastened into the curriculum, and the curriculum grows, without any adequate pruning of the older courses. After a certain degree of specialization has been reached, a curriculum becomes formalized. Emphasis shifts towards the satisfaction of mere formal requirements, that is, the "number of hours" spent, or the "number of courses" taken. State license requirements are especially demanding on the subject of "hours" and "courses", mistaking the shell for the kernel.

There has long been a dispute over the value of accumulated facts. The capacity of the human mind is not infinite. Multiplication of "courses," each crammed with "facts," can be carried out without limit. But the amount that the human mind can meaningfully absorb is definitely limited. When students are faced with series of 1600 page text-books, crammed with facts, when they are faced at the end of each

[2] Carman, H. J. Preprofessional survey of medical education: a progress report. *ibid, 146*:81, 1951.

[3] Willard Rappleye, quoted in Boles, R. S. Responsibility of physician to patient. *ibid, 147*: 712, October 20, 1951.

course with a detailed factual examination, there occurs a split in the mind which we may call scholastic schizophrenia. A distinction is made between material which is learned solely for the examination and then immediately forgotten, and that material which may be permanently retained as really meaningful. The student, before the examination, is in a schizoid state, out of contact with reality, living in a world of verbal statements. Only when the ordeal is over can he return to a state of sanity, that is, to a whole mind from which masses of undigested fact can be safely extruded.

The full absurdities of the system are exhibited by preparation for a license examination. Consider a young physician, recently graduated, who has been in successful practice for four or five years, who tries to be progressive and alert. Assume that, for adequate reason, he wishes to take license examinations for another state. He must once more enter the schizophrenic condition, piling detail upon detail back into his head, hoping to retain them until after the examination. Meanwhile the irony is, that he has been in successful practice for several years, and has been successful without carting around vast quantities of useless intellectual lumber. Why, then, emphasize such lumber in the first place?

The answer immediately comes back, because he needs all of these accumulated data as a *background* in order to practice medicine. This assertion I categorically deny.

If we could choose some successful practitioners of medicine, those who have the respect of both patients and colleagues, and could examine them on so-called *background,* the results might be pathetic in the extreme. From time to time, in court, a lawyer will try to discredit a physician witness by asking detailed factual questions whose answers have been long since forgotten. There are two possible conclusions. The lawyer implies that, since the physician doesn't know all these facts, he is therefore not a very good physician. The opposite conclusion is, here we have a good physician who does not remember all these details; therefore these details are not important.

They are not important, as background or as anything else, *for the practicing physician.* Because the medical practitioner is actually a technician, completely analogous to the radio repair man, the electrician, or the automobile mechanic. These are skilled occupations. Their practice demands ability to discriminate; judgment, often fortified by appropriate instruments of precision; ability to make a diagnosis from small and often subtle clues; dexterity in correction after the diagnosis has been made. Now, the practicing electrician must have some basic theoretical knowledge of electricity; the radio or television repair man, of electronics; and the automobile mechanic of mechanical principles. But we do not demand a college degree in electrical engineering before we allow an electrician to repair our house-wiring; nor a degree in mechanical engineering for the man who tries to remedy our automobile trouble. If such were required, the public might well complain of the high cost of automobile care, and agitate for state-subsidized automobile clinics.

The human body, the domain of the practicing physician, is far more complex than any automobile engine. Consequently it is reasonable to expect an especially keen sense of discrimination and a substantial amount of background material, more, perhaps, than is necessary for the radio repair man. But how much more? If we distinguish between the trained electrical engineer and the trained electrician, so also should we distinguish between the trained medical scientist and the trained practicing physician. The man who will be a practicing physician is living in a different world, confronted with different problems, from the scientist. Any attempt to give them both the same initial training is absurd.

We cannot dispute here how many "hours" of biochemistry or pharmacology or anatomy are necessary for the general practitioner or the genito-urinary surgeon. Suffice it to say that for the average medical student today far more is now required than is either necessary or desirable. And what is required is poorly integrated and poorly taught. After a certain minimum background has been provided, what is really important is the ability to discriminate, to analyze, and to evaluate. Instead, emphasis has been placed on assimilation of facts which are outmoded in a few years, and under any circumstances can be found in an appropriate text-book if needed.

Over-specialization in research has produced marvelous results. But in medical education there have been certain side effects: over-emphasis on sheer facts; complete loss of the goals or purposes in view; neglect of teaching; extraordinary waste of time, effort, and money in preparing students for what they will eventually do. Over-specialization and emphasis on research have made a mockery of teaching. Education, whether "liberal" or "technical," can be neither given nor conveyed. It can only be acquired through active effort. Essential education comes only from positive deliberate efforts of the student, which can be optimally exerted only in small groups in close contact with an interested instructor. Effective teaching requires a large staff and close personal relationships. If a log with Mark Hopkins at one end and a student at the other was the best university, what medicine needs today is more logs and more qualified instructors to sit at one end.

Instead, medical schools are seeking more and more research funds and more and more specialized research workers, so that more and more facts can be published. At the present time medical research is motivated very little by curiosity. Among the major driving forces are desire for prestige, hope for advancement, or, in the case of many middle-aged workers, inability to do anything else, even though any spark has long since disappeared. Very few scientific workers are capable of more than half a dozen enduring contributions in the course of a life time. A bibliography of several hundred or even a thousand titles is not a sign of scientific genius, but merely of vanity, exhibitionism, or social pressure.

III

At the present time research is inflated. It is watered stock and sadly needs to be dehydrated. Suppose that it were possible to pass some regulations. Let us assume that by some sudden decree, the following rules were put into effect: the number of existing medical journals must be cut in half; no scientific worker may publish more than one paper every two years; no paper may be more than 24 pages in length, and no paper may have more than two co-authors. What great benefits would result! As quantity dropped, the quality would immediately improve. Only the significant would be published, and that only in concise form. Genuine competition of ideas would result, and from real competition the strongest and most fruitful would survive.

Furthermore, what was published would be more widely read, and more widely and effectively utilized. Since the number of publications would be limited, attention would be more sharply focused. All the "marginal" investigators, those who "do" research because it is fashionable, or from other unworthy motives, would be forced to direct their energies elsewhere. Education, from the standpoint of both acquisition and instruction—that is, both learning and teaching—would be enhanced.

One of the great advantages now claimed for research would still be attained, but much more directly. It is commonly and justly said that one of the benefits of research is not the concrete practical results, but the valuable intellectual training for the investigator. Research, it is said, develops objectivity, patience, reasoning power, discrimination, judgment, industry.

All admirable qualities. But these are exactly the qualities which are conferred by a good education, whether "liberal" or "technical." Why call it research? If these qualities can be obtained only by a subsidized procedure known as research, then education has failed very badly. At present a list of publications is supposed to symbolize an alert inquiring mind. But all eudcation, of any sort, should encourage the alert inquiring mind. If research as a formalized business can be deflated, perhaps these desirable intellectual qualities can be acquired through suitable education, without cluttering up the literature in the process. If enough water were squeezed out of research, then a lot of energy and enthusiasms would be left over, unexpended. Such energy and enthusiasm could be devoted to improving our educational factors.

Of course, it would not be possible to squeeze out water without at the same time losing some of the desirable solids as well. If the total volume of publications were reduced, many good and worthwhile ideas would be delayed in coming to fruition. But the gain for educational purposes would be so great as to render insignificant the possible loss. A little delay might be a small price, if many evils could thereby be avoided, and if other counterbalancing advantages were gained.

It is, of course, quite impossible to make any such rules. But the same effect could come about if the amount of money available for research were curtailed. There would then be the same sharpening of competition and survival of the significant. There would be far less research and far greater improvement in quality. And the individual whose drive to research stems from an inner compulsion that is irresistible, the truly inspired research worker, would not be deflected.

If we really set to work to revise our educational methods, it would be possible to train very competent medical practitioners easily in five years after high school graduation. But at the same time we must realize the necessity of two types of physicians: the practitioners (and great majority of specialists), who are technicians; and the much smaller number of medical scientists. The distinction is similar to the electronics engineer and the radio repairman, as mentioned previously. Or perhaps we might dip into the Middle Ages for a comparison, where a great difference in education obtained between the lower orders of clergy and the doctors of theology. For parish work a profound study of theologic subtlety was not necessary; but for those in the higher administrative, judicial, and professional positions, long and detailed training in theology, with an advanced degree, was necessary. For the priest could take a great deal of doctrine on faith. It was enough that someone in authority was master of fine doctrinal points, and could give the reasons, the whys and wherefores of doctrinal dispute. For practical religion, for pastoral activity, the higher theological knowledge need not be personally at hand. Nevertheless to understand, define, and interpret the theoretical basis of religion, learned doctors of theology were necessary.

In similar fashion the practitioner, today, even if specializing, does not need to grasp intricate details of immunology in order to treat pneumonia, nor of bilirubin metabolism to operate for gallstones. The practitioner today is provided with diagnostic tests and therapeutic means. He must have judgment and skill and discrimination in their use or interpretation. But the theoretical background, in all but the most general terms, he can leave to the scientist.

He not only can, but he does. Sound intellectual comprehension of medical subtleties, in such fields as chemistry, immunology, or physiology, is reserved only for scholars or scientists. The practitioner today accepts the results on faith. Why not recognize this fact?

For the practitioner the current textbooks should be widely revised, all attempts at encyclopedic instruction dis-

missed, and general principles stressed without too much theoretical detail. The actual material taught must be abridged, but far more emphasis must be laid on correlation, utilization, and application. Instruction must concentrate on developing discrimination and judgment. "How do you apply what you know?" is more important than "How much do you know?" At the same time there must be respect for the unknown. The student must know where to find out something unfamiliar and must possess the desire to find it out.

With emphasis on correlation and general principles, a sound training for practitioners can easily be provided in five years after the high-school diploma. But for the scientist who will deal with the theoretical background of medicine, who will grasp the inner relationships and causes, who will extend our theoretical knowledge, a training of at least twelve years is necessary. The person who, for example, wishes to devote his life to furtherance of the preclinical sciences, must have a rigorous training in physics and chemistry as a preliminary. On the other hand the physician interested in psychiatry requires extensive study in sociology, history and anthropology. Some recognition must be made of differences in goal. The total period of training for the scientist would be comparable to what is now spent on the A.B. plus M.D. degrees, with extra time comparable to what is now spent for advanced residency or fellowship training. But the type of training would be quite different from what would be required of the practitioner. We must get away from the present uniformity which is generally inefficient for the practitioner, and inadequate for the scientist.

And where in this scheme is the place of the so-called liberal education? This, universally desirable for anyone with a requisite level of intelligence, is something for which the physician has no more prerogative than the machinist or electrician. One who wishes to practice medicine may take as much or as little "liberal" education as he pleases. But if he chooses to take a lot, the time so spent must not be considered a part of the medical training. Time spent in liberal studies must be its own reward. The enlargement of intellectual horizons is a personal, individual satisfaction. It belongs to whoever wishes to acquire it, and is as desirable for the practitioner of medicine as for the housewife or the salesman. Liberal cultivation of the intellect, however, as a personal and individual value, is not part of a professional training. It is not something which, because of the expenditure of time, should be chalked up to the expense of medical training and then written off in the form of increased fees for the patient.

The multiplication of scientific facts, stemming from modern research and scientific medicine, competes for educational time with the so-called liberal education. This is the occasion to reflect, what are we trying to do with the time devoted to education, both "pre-medical" and medical? If we are trying to make efficient practitioners of medicine, we are scarcely going about it in the efficient way. Are we trying to make every physician a research worker? Hardly a desirable goal. Are we attempting to compress the modern accumulated body of knowledge into the educational framework of forty years ago? It is not possible. Are we going to destroy the values of the liberal education, submerge them in the uncritical scramble to assimilate facts? Perhaps we are, even though we say we don't want to. Scientific medicine is one of the great triumphs of the era, but we have to give up something in return. The hidden price tag is beginning to show. Let us be sure that we are aware of the price.

Harvard Medical Society Meeting

Reported by Alvin Kahn, '53

JANUARY MEETING

The Harvard Medical Society met on January 15, at 8:00 p.m. in the auditorium of the Beth Israel Hospital. The program was sponsored by the Department of Surgery of the Hospital, Dr. Jacob Fine presiding.

The papers presented are summarized in the reports which follow.

Effect of Hemisulfur Mustard on the Ascites of Intraperitoneal Carcinoma

Arnold M. Seligman, M.D., Alexander M. Rutenburg, M.D., Lester Persky, M.D., and Orrie M. Friedman, Ph.D.

The present work developed from a chance observation in the course of a clinical study of the toxicity of hemisulfur mustard (HSM). This compound, which is an unstable oil, is stored in dry cold ether and if administered must be given as an emulsion intravenously because of its vesicant properties.

A man of 65 with prostatic carcinoma, previously subjected to prostatectomy, orchiectomy, and estrogen therapy, was admitted in an advanced state of the disease for relief of pain. He was given mg. of HSM primarily to determine its toxic effects. During the next five months the metastases progressed and he became much weaker. He was then given 500 mg. of HSM in three doses over a ten-day period. The drug produced nausea, vomiting, malaise, phlebitis and transient hysteria. Subsequently he gained thirty pounds in weight and the acid phosphatase dropped from ten to 2.7 units. After a remission of about six months, the acid phosphatase rose to six units and the patient eventually died of multiple metastases and pneumonia. The results in this case prompted further study of HSM.

In another case of slowly progressing prostatic carcinoma, drop in acid phosphatase was noted and a remission of several months' duration was obtained. One patient with carcinoma of the stomach and seven with ovarian cancer who had peritoneal carcinomatosis and ascites showed a similar amelioration of their disease. There was a simultaneous disappearance of the ascites. Some of these patients had previously required paracenteses every five to seven days, but after receiving the drug none were required. In two cases with positive cell blocks, cells disappeared from the fluid. None of these patients responded as well to a second course of therapy. All have died of their disease.

While it is too early to assess the life-prolonging capacities of HSM, the disappearance of a previously palpable mass in one case and the pronounced remissions observed in several others are encouraging. The discovery of a member of the mustard family that appears to exert a palliative effect in carcinoma rather than in lymphoma is of particular interest.

The toxic effects of the drug are as follows: while phlebitis developed in almost every case at first, the use of a polyvinyl catheter, introduced into the subclavian vein via the median basilic vein, has to a large extent obviated this drawback. It is one-sixth as toxic as mustard gas when applied to the skin and one-thirteenth as toxic as methyl bis (beta-chlorethyl) amine, used in the treatment of lymphoma. In 31 cases the principal toxic reactions noted were thrombophlebitis, malaise, weakness, nausea, vomiting and tremors. There was no damage to the hemopoietic system, kidney or liver. Twenty-one showed no clinical improvement. They included cases of lymphoma and carcinomas of the stomach, colon, breast, lung, kidney, thyroid, ovary, prostate, and oral mucosa. In one case unilateral athetoid movements proceeding to convulsions were noted, but other than slight blurring of vision, no sequellae followed. The patient remained in remission for eight months, after which she was given HSM with dilantin. No convulsions appeared, although there was slight nausea and vomiting.

Criteria for Suitability of Plasma-Volume Expanders. Evaluation of Polyvinylpyrrolidone.
Herbert A. Ravin, M.D.

Awareness of the need for an effective and safe plasma-volume extender has recently been sharpened by the apprehension of casualties on a scale outstripping the resources of whole blood and plasma. Plasma itself is unsafe because of the danger of viral contamination. Human albumin may prove safe from viral contamination but the amount available is too small to solve the problem of stockpiling. Other materials serve primarily or exclusively to supply the oncotic properties of blood. Gelatin, which is reasonably satisfactory, has the disadvantage that it is not liquid at room temperature or below, and that it may produce a transient renal injury. Acacia has proven objectionable because in some recipients after ten or fifteen years damage to liver and spleen was observed. Dextran is not satisfactory because it is antigenic.

Polyvinylpyrrolidone (P.V.P. or Periston) has been under study since its use by the Germans during the last War. It is a synthetic polymer of acetylene and formaldehyde. The molecular weight (MW) ranges from 15,000 to 140,000 with a mean of 50,000 to 60,000. A 3.5% solution approximates the oncotic pressure of plasma, and the pH of 4.2 of the aqueous solution is easily brought to neutral by small amounts of sodium bicarbonate.

Although wartime records have been lost, the impression of those who used the material then and subsequently is that rather good clinical results are obtainable, without toxic reactions. The present evaluation of P.V.P. was directed towards determining the picture of its distribution and retention in the body and the process of its excretion by use of tracer radioactive carbon and iodine. Interpretation of results permits definition of those qualities which would be most desirable in commercial preparations of the polymer.

Within two to three hours after injection, equilibrium is attained between plasma and extra-cellular fluid (ECF) by molecules less than MW 30,000, while during the first twelve hours molecules of MW 16,000 appear in the urine. During the following three days the urinary MWs approach 60,000, which appears to be the limiting size for glomerular filtration. P.V.P. is not metabolized. A very small amount is excreted into the bile and lost in the feces. Virtually all the injected material which can be excreted leaves the body via the urine.

After about two weeks about 40 to 45% of the administered dose is still retained in the body. Urinary excretion at this time and thereafter is 0.06% of the administered dose. The retained material, of high MW, is distributed widely in low concentration chiefly in the subcutaneous tissues and muscle. However 15 to 20% is held indefinitely in high concentration by the reticulo-endothelial system. The MW of this fraction is about 120,000. P.V.P. of a MW below 25,000 is excreted within one hour and is, therefore, of little use. The ideal preparation should have an MW spectrum from 30 to 60,000 and should be totally excretable within a few days. Even such a preparation is retained to only about 10% after twelve hours. These limits are also held to apply for other non-metabolizable polymers for use as plasma expanders, in view of the typical configuration of the P.V.P. molecule.

The tendency of P.V.P. to expedite the excretion of such bacterial toxins as those of diphtheria, shigella, and botulinus suggests a therapeutic value apart from its oncotic properties.

Present commercial preparations are not satisfactory. Fractions conforming to the ideal requirements are becoming available on a small scale for clinical testing now in progress.

The Role of Intestinal Flora in Experimental Vascular Injuries to the Gut
Jacob Fine, M.D.

The importance of antibiotics as a valuable adjunct in the surgical therapy of intestinal lesions may be inferred from

this series of experiments conducted on dogs. Loops of lower ileum were subjected to venous or arterial occlusion, or both, with division of the adjacent mesentery. Results were noted in untreated dogs as well as in those receiving previous orally administered aureomycin, oral or intravenous aureomycin following the injury, and in those receiving the drug intraluminally at the time of occlusion. Striking increases in the survival rate appeared in the enterically treated animals, while those given the drug parenterally fared only slightly better than their untreated mates. A similar therapeutic differential obtained in previous experiments on appendiceal peritonitis and acute hemorrhagic pancreatitis, suggesting that local action of the antibiotic is the crucial factor in its efficacy.

The role played by the antibiotic was deduced to be one of limiting bacterial interference with the re-establishment of adequate collateral vascular channels. However, administration of aureomycin in occlusion of both arteries and veins was attended by only small increments in survival rate, indicating that there exists a minimum revascularization potential which must be preserved. By means of thorotrast injections, the collateral circulation developed in recovered animals was demonstrated to derive principally from the omentum, which was bound firmly around the traumatized gut. Next in importance were arcades in the mesentery bridging the occluded points and new vessels from the root of the mesentery, while the contribution from other surrounding structures was minimal. Only two of twelve dogs whose omenta were previously removed, survived in spite of antibiotic therapy.

In unprotected dogs the fluid lost into the loop and peritoneal cavity was about 150 cc. On the other hand, aureomycin prevented the accumulation of peritoneal fluid. Most of the fluid loss was due to bacterial action. The death in unprotected dogs cannot be attributed to blood volume loss.

Histologically, the suppression of bacterial action was found to limit intravascular hemolysis and thrombosis, preserve the integrity of the vessel walls, and permit a more flourishing inflammatory reaction.

The cultural data did not implicate any single bacterial species. The effectiveness of various intestinal antibiotics with wide but dissimilar spectra suggests that a number of species, perhaps acting synergistically, are responsible for preventing the development of an adequate collateral circulation.

Effect of Antibiotics on Irreversibility to Transfusion in Hemorrhagic Shock

Jacob Fine, M.D.

The possible sources of sepsis in the standard experiment were groin wounds made for cannulization, the tissues of the dog, and the resident flora of the intestines. Identical results with septic and sterile operative techniques eliminated the first from consideration. The role of the Clostridia normally present in the dog tissues was found to be of no consequence, when no changes in survival rate followed immunization by toxoid or administration of antitoxin before and during the period of shock. Parenteral aureomycin met with but equivocal success, while oral administration in advance of the experiment produced an 88% recovery rate, as well as a much longer tolerance of the severe hypotension and blood-volume deficiency. Further evidence supporting the view that intestinal bacteria are responsible for the development of irreversibility is that neomycin, which is almost entirely eliminated in the feces, was as effective as oral aureomycin.

Since neomycin does not suppress Clostridia, this organism in the gut cannot be implicated. Indeed, a single priming dose of neomycin produced a greater survival rate than a single priming dose of aureomycin, suggesting that the coliforms, which are more susceptible to neomycin might be the offending species. But since intra-enteric penicillin also has a good ef-

fect, it is possible that gram-positive organisms are implicated as well.

Whether the intestinal flora act by invasion of the circulation, or by elaboration of toxins to which the hypoxic gut is more permeable, is to be determined. Present evidence appears to favor the first mechanism, since it was demonstrated that aureomycin given through the portal vein achieved the same results as by mouth.

While hemorrhagic shock is in the early phases reversible by simple transfusion, it appears that antibiotics are necessary if irreversibility to transfusion is to be prevented in the later stages. Clinical application of these results suggests a trial of antibiotics not only in septic shock, but in burn shock, as well as in hemorrhagic shock which proves intractable to transfusion.

The Bacterial Factor in Hemorrhagic Shock: Standard Control Experiment

Howard Frank, M.D.

In order to ascertain the processes responsible for irreversibility in shock, there was devised over the course of ten years a standard experiment of maintaining dogs at a constant level of hypotension until restitution of previously withdrawn blood was inadequate to effect recovery. The average time necessary to achieve this condition was approximately four hours, though less when complicating traumatic factors such as tissue injury and anesthesia were introduced. This coincided (85%) with a taking up by the dog of 40% of the blood which had originally passed to a reservoir sustaining the low pressure. Attempts were made, with most meticulous controls, to prolong the time of onset, although it was never feasible to correct irreversibility once developed.

It was found impossible, by means of augmented transfusions, oxygen and pressor drug administration, to alter the course of development of irreversibility, nor were cortisone or ACTH given prior to or during the experiments capable of modifying the shock. Correction of abnormal blood chemistry by artificial kidney dialysis was similarly unattended by success.

It was possible, however, to escape irreversibility by cross-perfusion of the liver of the shocked dog via the splenic vein. Similar perfusion of the jugular vein was ineffective. The attempt at cross perfusion was met with increased portal pressure and consequent intestinal congestion. While portal hypertension sometimes interfered with continuation of perfusion, prevention of splanchnic sequestration of blood by portal-caval shunt had no effect on the development of irreversibility.

No role can be ascribed to vaso-depressor material (VDM) in these respects, for not only is it incapable of inducing shock, but no effect was observed on survival after massive administration of this substance. Finally, the part played by indigenous bacteria was investigated, the results recounted in the final lecture.

Alumni Day

RAIN OR SHINE

WEDNESDAY, MAY 28, 1952

Registration — All Day
Building A, Harvard Medical School

Hospital Visits — 9-12 a.m.

John W. Cline, '25 — 12 noon
President, American Medical Association
Amphitheatre E, Harvard Medical School

Buffet Luncheon (rain or shine!) — 12:30 p.m.
The Quadrangle, Harvard Medical School

Alumni Day Symposium — 2-4 p.m.
Amphitheatre E, Harvard Medical School

Dr. Mark D. Altschule—*Recent Advances in a Backward Field, or Relations between Endocrinology and Psychiatry from 1682 A.D. to the Present Day*

Dr. Walter Bauer—*The Modern Medical Triology*

Dr. Reginald Fitz—*How to Get your Sons into Harvard Medical School*

Dr. Dwight E. Harken—*The Abuse of the Surgeon by Physicians whose Patients have Mitral Stenosis*

Dr. A. Baird Hastings—*Biological Adventures with Isotopes*

Dr. Arthur T. Hertig—*A Pathologist's Retreat into the Embryonic State*

Dr. Eugene M. Landis—*The Human Element in First-Year Physiology*

Dr. S. Burt Wolbach—*The Glorious Past and the Uncertain Future of Pathology*

Alumni Day Committee

Crawford H. Hinman, *Chairman*
George Packer Berry
Hermann L. Blumgart
Hathorn P. Brown
J. Englebert Dunphy
Franc D. Ingraham
Curtis Prout
Merrill C. Sosman

The Association of American Medical Colleges Elects a New President

Walter S. St. Goar, M.D.*

Dr. Berry

Dr. George Packer Berry was installed as the 56th president of the Association of American Medical Colleges at the Association's 62nd annual meeting at French Lick Springs, Indiana, on October 31, 1951. Thus Dr. Berry's name is added to the list of previous Association presidents on which one finds such outstanding medcal figures as William Osler, Hugh Cabot, William Pepper and, more recently, Willard Rappleye, Joseph C. Hinsey and Arthur C. Bachmeyer. Although the Association has carried on its affairs with a minimum of display, it has come to represent one of the most constructive forces in American medicine. It is the official representative of all the medical schools in the country and the only organization whose activities are devoted solely to the advancement of medical education.

The importance of the Association of American Medical Colleges as an organization is in large measure a reflection of the significant role played by its constituent medical schools in our society. Of necessity, they must play the principal part in an effective program of medical education. Inasmuch as they select the student candidates, they determine who the doctors of tomorrow are to be. Thus the schools are not only responsible for the embryonic physician's professional training; they provide also in large part for the training of specialists and for other postgraduate types of education. They take the lead in medical research and in the training of medical investigators. Finally, the schools with their associated hospitals form, in many communities, the hub around which all the medical and health services function.

The history of the Association of American Medical Colleges goes back to another post-war period when, much as today, there was a great need for more physicians. Following the Civil War, immigration produced rapid increases in population. Simultaneously there were shifts in population, numbers of people moving westward, especially into the Mississippi Valley. These factors led to a significant shortage of doctors, which in turn stimulated the development of new medical schools. Many of these new schools were commercial enterprises, set up to make money, incredible as this may seem today. Many were "diploma mills." This fact, plus the demand for physicians, led to a serious lowering of the standards of medical education and to a consequent lowering of the standards of medical practice.

Stimulated by this unhappy situation, representatives of the leading medical schools met in 1876 at Jefferson Medical College in Philadelphia. The purposes of the meeting were the consideration of "all matters relating to reform in medical col-

*Dr. St. Goar, a graduate of the University of Rochester Medical School, served as Assistant to the Dean in the Office of Admissions, Harvard Medical School, during the fall of 1951.

lege work" and the "suppression of existing evils." Twenty-two schools sent representatives to the meeting; nine others sent communications. The convention decided to form a permanent organization and a committee was appointed to draft a constitution and by-laws.

In 1877 a second meeting was held at the Palmer House in Chicago. It was largely devoted to a consideration of the proposed constitution and by-laws. As finally adopted, the constitution states as the object of the newly-formed organization, "the advancement of medical education in the United States and the establishment of a common policy among medical colleges in the more important matters of college management."

Thus the Association of American Medical Colleges was born in 1877, although it did not assume this name until 1890. During the intervening years, standards of medical education have been emphasized by the organization. To attain membership, medical schools must meet these standards and must maintain them. The Association helps the individual school in many ways to do so. In 1951, for the first time, every medical school functioning in the United States met the Association's minimal requirements of educational practice.

In carrying out its fundamental aim, the advancement of medical education, the Association has assumed many responsibilities of benefit to all its member schools. It publishes the *Journal of Medical Education*. It compiles and publishes useful statistics each year in such fields as the following: applicants for admission to medical schools; accomplishment records of students in medical schools; accomplishment records of students in medical schools, according to the liberal arts college last attended; and correlations between students' scores on the Medical College Admission Test and their performance in medical schools. In 1948 the Association established the Medical Film Institute, now renamed the Medical Audio-Visual Institute. At present the Association, in conjunction with the Council on Medical Education and Hospitals of the American Medical Association, is conducting a survey of medical and pre-professional education.

At the annual meetings of the Association, the deans of the American medical schools, faculty members and others interested in medical education, study the many problems and trends in this field. Panel discussions are held on a wide variety of subjects: the optimal medical-school curriculum, improvements in teaching methods, educational aspects of internship and residency programs, improvement in hospital ward and out-patient care, adequate financing—in short, the many aspects of the complex world of today as they affect medical education.

Dr. Berry has taken an important part in many of these activities. During World War II he was much involved in the training programs for young doctors, particularly with the challenge of meeting military needs for doctors while at the same time preserving the standards of medical education. Thus he served on the Association's Preparation-for-War Committee and subsequently on the Planning Committee for the National Emergency. He has been a member of the Committee on Student Personnel Practices and chairman of the Committee on Financial Aid to Medical Education. He had much to do with establishing the Office of the Director of Studies of the Association. Since 1948 he has been a member of the Executive Committee. In 1947-48 he was vice-president and last year president-elect before assuming the office of president in the fall.

The Medical School and the Alumni Association are proud to share in the honor that goes with Dr. Berry's position of national leadership in medical education.

Alumni Giving, November 9 to March 1, 1952, Reaches $64,000

We present below a progress report on the new Alumni Program for Annual Giving. Solicitation for the current academic year will continue through June 30. Comparative statistics are unfair at this time, as some classes have just sent out their letters and four (1926, 1942, 1945, 1950) are not yet mailed. For classes soliciting in 1951 through the Harvard Fund we append their year's totals in the right-hand column, since some of their statistics in this report are not truly representative.

Class	*Class Agent(s)*	*Living Members*	*Participation Givers*	*Participation Percentage*	*Amount*	*1951 Total Givers*	*1951 Total Amount*
1878-1893		42	6	14.3	$ 533		
1894		15	2	13.3	35		
1895		10	1	10	5		
1896		22	1	4.5	2		
1897		7	2	28.6	30		
1898		22	4	18.2	136		
1899		34	1	3	100		
1901	Horace Binney	40	9	22.5	205		
1902	George W. Winchester	50	9	18	515		
1903	John Homans	51	11	21.5	710		
1904	J. Dellinger Barney Walter G. Phippen	61	3	5.9	25		
1905	Francis L. Burnett	29	4	13.8	90		
1906	Horace P. Stevens	36	9	25	197		
1907	James B. Ayer	31	6	19.7	248		
1908	George G. Smith	35	14	40	528		
1909	F. Gorham Brigham	32	3	9.4	113		
1910	Alexander M. Burgess	46	3	8.7	175		
1911	J. Howard Means	55	7	12.7	400		
1912	Francis M. Rackemann	43	17	39.5	1005		
1913	George P. Denny	46	12	26.1	980		
1914	W. Richard Ohler	60	7	11.7	485		
1915	Arlie V. Bock	66	15	22.7	710		
1916	Thomas R. Goethals	52	14	26.9	1470		
1917	Leroy E. Parkins	51	8	15.7	310		
1918	Donald S. King	68	12	17.6	955		

1919	Joseph Garland	81	12	14.8	615	
1920	Charles C. Lund	80	21	26.3	1372.50	
1921	Harold R. Merwarth	85	3	3.5	250	
1922	G. Colket Caner	91	12	13.2	1770	
1923	Robert Goodale	106	34	33	1330	
1924	George C. Prather	111	19	17.3	1385	
1925	Wm. N. Wishard, et al	112	26	23.2	5785	
1926	Henry E. Gallup	118	1	1	100	
1927	Charles J. E. Kickham	120	39	32.5	3975	
1928	Myles Baker	119	33	27	3330	
1929	Herbert E. Hedberg	123	50	40.7	6990	
1930	Alfred O. Ludwig	132	35	26.7	3985	38—$5480
1931	John A. Abbott Charles H. Bradford	124	41	33.1	2175	73—$2415
1932	Carl W. Walter	127	33	26	3611	44—$6626
1933	Edward Hamlin, Jr.	122	29	23.8	2086*	
1934	Richard Warren	128	22	17.2	1653.50	80—$4776
1935	George P. Whitelaw, Gordon A. Donaldson	131	27	20.6	1172	73—$3787
1936	Howard Ulfelder	130	50	38.5	1987	
1937	Joseph R. Frothingham	135	36	26.7	1690	
1938	Irad B. Hardy, Jr.	132	31	23.6	1007*	
1939	Frederick P. Ross	126	19	15.1	390	94—$1183
1940	W. Benjamin Bacon	132	59	44.7	4303	
1941	Curtis Prout	131	29	22.1	1222	
1943-A	James H. Jackson	141	41	29.1	1095	
1943-B	Richard S. Bagnall	131	3	2.3	45	
1944	Robert W. Taylor, Jr.	141	26	18.4	299.50	
1946	Milton W. Hamolsky	142	43	30.3	306	
1947	Hermes C. Grillo	127	30	23.6	176	
1948	Curtland C. Brown	138	31	22.5	272	
1949	John W. Keller	141	27	19.1	222.50	
1951	Edward G. Dreyfus	146	12	8.2	50	
Men in classes not listed		397				
	Total	5224	1059	20.3	64,612.50	

**Also contributing to a class insurance policy.*

Honors

Kew Studio, Albuquerque, N. Mex.

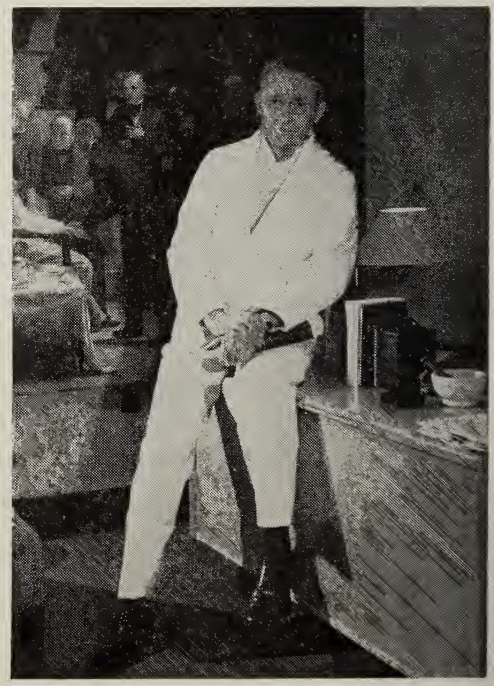
WALTER M. BOOTHBY, '06, professor *emeritus* of the Mayo Foundation and head of the respiratory laboratory at the Lovelace Foundation for Medical Education and Research, Albuquerque, New Mexico, has recently had conferred upon him the high order of Commander of the North Star, by His Majesty the King of Sweden. The award was given in recognition of Dr. Boothby's services to Sweden in the field of aviation medicine. Readers of the BULLETIN will recall the interesting account of his experiences in Sweden (1948-1950) which appeared in the June 1951 issue.

The presentation of the award took place in Albuquerque on January 31, at the home of W. Randolph Lovelace, II, '34. Gunnar Dreyselius, the Swedish Consul at Houston, Texas, made the trip to Albuquerque to confer the honor on Dr. Boothby in the name of the King.

HENRY K. BEECHER, '32, anaesthetist-in-chief at the Massachusetts General Hospital, has been made a Chevalier of the Legion of Honor by the President of France. Official notice of the award was transmitted by the French Ambassador, M. Henri Bonnet, and the presentation was made by the Consul General of Boston, M. Chambon, with the following citation:

"Dr. Henry K. Beecher, professor of research in anaesthesia at the Harvard Medical School, has rendered invaluable services to the science of medicine by his remarkable achievements in the field of his research. By his development of synthetic agents to replace morphine, he has moreover made an eminent contribution toward the relief of pain and earned the gratitude of all peoples. France is in the front line of those who feel called on to recognize publicly Dr. Beecher's services."

He has also recently been made an honorary member of the Royal Society of Medicine (London), "for services to science."



ROCKY MOUNTAIN HARVARD MEDICAL SCHOOL ALUMNI ASSOCIATION

It is our good fortune to have secured Edward D. Churchill, '20, as our next Harvard Lecturer. The Lecture will, as usual, be given at five on a Friday afternoon this coming autumn at the University of Colorado Medical Center, Denver. Tentatively, the date of November 7 has been chosen.

Dr. Churchill is John Homans Professor of Surgery at the Harvard Medical School and chief of the surgical services at the Massachusetts General Hospital. While his major interest lies in the cut, snip, and sew sector, his talents and interests are by no means confined to it. Hence, at this time, it is anybody's guess as to the title his presentation will bear at the time of delivery.

The triad of events that surround the Harvard Lecturer's visit to us each year will be completed with the Alumni Dinner in his honor which follows the Lecture and the Clinic to be given by him at eight the next morning, Saturday the 8th, at the Denver General Hospital.

Those interested should watch this spot in subsequent issues of the BULLETIN where the final details will appear when they have been completed.

Ira Dixson, '28

REUNION IN HONOLULU

A reunion was held in Honolulu, November 14, 1951, for graduates of the Harvard Medical School who were attending the Pan-Pacific Surgical Congress in that city. The party was held at the Racket Club, where a phicken (cross between a pheasant and a chicken) dinner with Hawaiian trimmings was served. John W. Cline, '25, of San Francisco, president of the American Medical Association, was among those present.

HARVARD MEDICAL SOCIETY OF NEW YORK

The Harvard Medical Society of New York met at the Harvard Club of New York City on Thursday, March 27. The speaker of the evening was Justice Irving H. Saypol of the Supreme Court of the State of New York, who gave a revealing and timely address entitled, "Clinical Observations by a Federal Prosecutor on the Malignancies of the Commonwealth." Approximately one hundred alumni of the New York metropolitan area were present.

Officers of the Society are Irving L. Cabot, '20, president; George M. Wheatley, '33, vice-president; and Kenneth W. Thompson, '29, secretary-treasurer. John N. Robinson, '31, is chairman of the Membership Committee. All Harvard Medical alumni interested in attending the semi-annual meetings of the Society are invited to get in touch with Dr. Robinson at 755 Park Avenue, New York City. The group provides opportunity for friends to meet and at the same time enjoy a lively speaker.

KENNETH W. THOMPSON, '29

HARVARD MEDICAL CONSULTANTS IN KOREA

More than 150 medical officers representing UN organizations throughout Korea recently completed the first of a series of intensive three-day refresher courses on modern medical techniques. The first course, held in Pusan, dealt with diagnosis and treatment of diseases of the chest. Donald S. King, '18, a consultant to the Army Surgeon General, was guest speaker and director of the course, which included lectures, demonstrations, motion pictures, case presentations and discussion periods.

Richard Warren, '34, will spend the month of April in Korea on a similar assignment in the field of surgery. Another alumnus, Laurence B. Ellis, '26, reported on his experiences as a consultant in the January issue of the BULLETIN.

EDUCATIONAL SCHIZOPHRENIA

Lester King's thesis that over-emphasis on medical research is a major root of the evils which beset medical education cannot be dismissed lightly, since he has had an opportunity to study the problem in several different schools both here and abroad. The Bulletin is delighted to publish such firm convictions on this important topic. We are obliged, however, to take issue with him.

No one would deny his allegations. The medical curriculum is weighted with non-essential facts and badly wants general principles and integration. There is no reward for teaching except the satisfaction it gives the teacher. Medical research is over-emphasized, top-heavy with money and effort and directed more at production than progress. It unquestionably fosters specialism. But paradoxically it is the best and most creative research which does so. To restrict it would be to restrict progress. It is not "research" in the unwholesome sense in which King uses the word that has created our difficulties. It is progress which has done so.

One need only read The Report of The Harvard Committee on General Education to realize that the faults of medical education are common to all fields of endeavor: "Why has this become so strong in recent years? Among many reasons, three stand out: the staggering expansion of knowledge produced largely by specialism and certainly conducive to it; the concurrent and hardly less staggering growth of our educational system with its maze of stages, functions and kinds of institutions; and not least, the ever-growing complexity of society itself." There is need for integration of general and special education in medicine as in other fields of knowledge.

King's proposal, however, that the practicing physician be given a five year technical training and the medical scholar or scientist (the terms are by no means synonymous) be given an entirely different eight or twelve year training would compound rather than solve the problem. This would be "educational schizophrenia," a state far worse than the "scholastic schizophrenia" of which King complains. From which group would come the teachers of the future? Who is so astute that he could choose the men for so great a dichotomy? Is not the practicing physician more in need of a broad background than the research worker? And does this not imply a fundamental training in the basic sciences? A surgeon need not understand the physiology of the liver to remove the gall bladder, but if he does not, the operating theatre is reduced to the intellectual level of the slaughter house.

A change is needed. Both practicing physician, medical scholar and potential scientist should be exposed to a broad, well planned general education in medicine. And if it is called medical education, it should be oriented to the patient. Specialism can come later, whether it be specialism in the technical, practical or scientific aspects of medicine. Research

then will spring from many sources, not the least of which is the practicing physician himself as is demonstrated by the important work of William N. Pickles in the little village of Aysgarth, Yorkshire.

Perhaps the experiments with the medical curriculum now in progress at Western Reserve and the University of Colorado will show the way.

Correspondence

A MAJOR SHATTUCK STREET PROBLEM

To the Editor:

Having had infrequent occasion in recent years to visit the offices of the Harvard Medical School, I was struck recently by one important change that has taken place in that vicinity. I refer to the almost impossible parking situation, due, no doubt, to the number of lesser institutions that surround our own classic marble group.

It had seemed to me appropriate that I should in person bear my gift to the Alumni Fund, but it turned out that I was no Wise Man. I repeatedly made the circuit of Longwood Avenue, Shattuck Street, Huntington Avenue and the Medical School back yard, but like Lucifer I found no place to light.

Five hospitals including the cat and dog sanatorium, two high schools, a college of pharmacy, a dormitory for medical students and one for nurses (and I believe these are too close together), an office building and a school for public health, in addition to the Medical School, is too much. There is plenty of chance for travel, but no curb service.

I should like to propose a solution for the problem that would serve the general interests of the Medical School as well as tending to increase those gifts to the Fund that others, like myself, may wish to bear in person. It is to turn the now quite useless lawn in the Quadrangle of the School into a parking space for all who have legitimate business there. Of course most of the trees would have to be removed, but once that was done a substantial black top surface could be applied at a reasonable cost and the whole plant could be made more in keeping with the Automotive Age.

I should like to commend this project to the Dean and the Corporation and feel sure that it will receive the hearty support of most of your readers.

Quentin T. Hardy, '19

P.S.—The original outlay could be amortized in a relatively short time by charging Faculty members a small fee for the use of the facilities —say, fifty cents daily.

Ed:

Your suggestion for solving the parking problem at the Medical School and hence indirectly facilitating the leaving of gifts to the School by the alumni is a thoughtful one to which the Administrative Board will undoubtedly give due consideration.

It may be of interest to you to know that there is a school of thought which recommends that the alumni be encouraged to solve their parking problems by selling their cars and giving the proceeds to the School. Under such circumstances, transportation can be arranged by telephoning the Dean's Office.

"THE STETHESCOPE"

To the Editor:

For many years I have planned to write a "letter to the Editor," but my chronic gluteal plumbism has always interfered. At last the time has come, however, and I hasten to ask how much longer the graduates of Harvard Medical School must be subjected to the amazing misspelling of the word "Stethoscope" which always appears as "Stethescope," at the head of the column of that name in the Bulletin. Profound research in the latest editions of Dorland and Gould fails to reveal such an error, and derivation from a Greek word pronounced "stethos" would seem to indicate an "o" rather than an "e."

It seems most unfitting for one whose classical education was obtained at Yale to feel obliged to call such a mistake to the attention of the editor of a Harvard publication.

Or will I be confounded by some abstruse etymological discourse?

Alexander T. Bunts, '24

Ed:

Spelling "Stethoscope" with an "e" instead of an "o" is an ancient error which was fallen into by no less a scholar than Dr. Reginald Fitz, who edits that column in the Bulletin. His attention was called to this error several years ago by a Harvard alumnus who, after careful research, was convinced that there was no justification for that spelling. Not one to be easily beaten down, Dr. Fitz decided to continue to publish the column under the heading "Stethescope" until such time as another Harvard Medical Alumnus would object to it. It appears that the time has come and alas, how unfitting it is that it should come from Yale!

However, I am not sure that Dr. Fitz will see fit to change the spelling. Perhaps we shall have to wait until a Harvard Medical alumnus educated at Harvard detects the error!

William Lloyd Aycock, 1889-1951

William Lloyd Aycock died in Boston on October 24, 1951 at the age of sixty-three. The Harvard Medical School has been deprived of an original and constructive mind. Those who knew him well are now without the refreshment of spirit that came from his penetrating wit, his warmth of heart, his unshaken equanimity and his true charity—qualities for which today the need is great.

His intellectual and professional life display a remarkable adherence to a single major theme. First and last he was the epidemiologist and the dominant disease was poliomyelitis. But in no sense was he the narrow specialist. To the problems presented by the epidemiology of infantile paralysis he brought knowledge of many disciplines and the wide acquaintance with the behavior of other infectious diseases. His work was distinguished and lifted out of the realm of the immediate and routine by the breadth of his biologic philosophy and the force of his scientific imagination.

The bare outline of his studies on poliomyelitis will serve to illustrate these characteristics of his thinking and will reveal how they bore fruit in the laboratory and in epidemiologic analysis. His first paper on this disease, to which he was in large part to devote the rest of his life, appeared in 1923. It was a conventional clinical study of the effect of combined treatment with convalescent serum and hypertonic salt solution. A year later, however, the first of the epidemiologic studies was published in which the fact that cases of poliomyelitis continue to occur during the months of winter and early spring was given emphasis.

This and subsequent investigations of a similar sort stemmed from his fundamental thesis that poliomyelitis does not differ from other infectious diseases in any essential character. Again and again he stressed this biologically sound hypothesis, supporting it with evidence gained from many sources and by a variety of techniques. A favorite and productive method, applied as early as 1925, consisted in the comparison, under carefully selected circumstances, of the epidemic behavior of poliomyelitis with that of other infections. The results of such investigations when later correlated with those he derived from the application of immunologic procedures have dissipated much of the mystery that has surrounded this disease. For it is largely to the insight and pioneering labor of Lloyd Aycock that we owe the knowledge that infection with the virus of poliomyelitis occurs with great frequency—indeed as frequently as infection with the viruses of measles or mumps. Only rarely, however, does such infection give rise to paralysis. These elemental facts must henceforth always be borne in mind by the clinician attempting to diagnose the doubtful case, the immunologist seeking ways of specific immunization and the public health officer striving to limit epidemics.

This demonstration of the ubiquity of infection contrasting with the rarity of paralytic manifestations led him to formulate a second generalization. He came to regard the development of paralysis as an unusual event, almost as an accident, that depended upon factors intrinsic in certain individuals but which also might be influenced to a degree by extrinsic conditions such as season or climate. From this concept again arose a series of investigations with significant results. Poliomyelitis virus is widespread in warmer climates, paralysis, nevertheless, is there extremely uncommon; many who recover from the disease present signs of endocrine imbalance; poliomyelitis may occur more frequently in pregnancy; the bulbar form is apt to follow the recent removal of tonsils. So, intelligently and persistently he sought to distinguish the host factors—the autarceologic elements as he called them—that mediate the transforma-

tion of the common benign infection into the severe and crippling disease.

These fundamental hypotheses and observations have provided the impetus to further investigations by many others. They will continue to have this effect until complete understanding and control of this and other infectious diseases are achieved.

We have said little of his life or of his qualities as a man. It is sufficient to affirm that the Medical School is a better place because for thirty years he worked within its walls; that his friends while they live will gratefully preserve the memory of his modesty, his courage and his intellectual enthusiasm. We believe he would have it so; that he would have chiefly remembered here that part of him which will surely endure. For, like Francis Bacon, "all other ambition whatsoever seemed poor in his eyes compared with the work he had in hand; seeing that the matter at issue is either nothing, or a thing so great that it may well be content with its own merit, without seeking other recompense."

John F. Enders
John E. Gordon
David D. Rutstein

Necrology

1887

HARDY PHIPPEN died at Salem, Mass., January 7, 1952.

1896

HYRUM ANDREW ANDERSON died at Rigby, Idaho, December 29, 1951.

1900

WILLIAM FLETCHER died at Wickenburg, Ariz., February 13, 1952.

1901

GEORGE FREDERICK O'DAY died at Worcester, Mass., January 18, 1952.

HAROLD WELLINGTON SMITH died at Bethesda, Md., February 4, 1952.

NATHANIEL KNIGHT WOOD died at Cambridge, Mass., January 3, 1952.

1903

ELMER WALTER BARRON died at Boston, January 20, 1952.

1904

GORDON NILES MORRILL died at La Jolla, Calif., February 13, 1952.

1906

CARLETON RAY METCALF died at Concord, N. H., January 17, 1952.

1907

GEORGE MAURICE SHEAHAN died at Boston, December 14, 1952.

1909

WILLARD STEPHEN PARKER died at Boston, February 18, 1952.

1910

HARRY CARVER CLARKE died at Marblehead, Mass., February 21, 1952.

1910

ISAAC GERBER died at Providence, R. I., February 17, 1952.

1912

EZEKIEL PRATT died at Brewster, Mass., January 19, 1952.

1913

FRANCIS GILMAN BLAKE died at Washington, D. C., February 1, 1952.

1914

FRANK WILLIAM MARVIN died at Salem, Mass., February 3, 1952.

1918

SETH FRANCIS HARRISON HOWES died at Worcester, Mass., Februrary 1, 1952.

1919

PATRICK EDWARD GEAR died at Holyoke, Mass., January 20, 1952.

1920

WILLIAM ELLIOTT SAVAGE died at Portland, Oregon, November 7, 1951.

1947

WILLIAM GASTON PALMER died at Cleveland, Ohio, November 25, 1951.